The ArcReader Wind Resource Data Explorer

The Wind Resource Data Explorer (WRDE) was created by TrueWind Solutions LLC to allow users to view and query spatial data in an interactive environment, as well as modify, copy, and print maps. This CD contains an ArcGIS published map file (.pmf), related spatial data, and other associated files necessary to view the interactive map using ArcReader. The CD also contains files not used by ArcReader including ArcGIS map document files (.mxd) that can be opened by members of the ArcGIS suite of software, and static image files (such as JPEG or PDF) of various wind resource maps. The spatial data used by ArcReader can also be imported by various GIS software packages.

ArcReader is a free program created by the Environmental System Research Institute (ESRI) to allow for the sharing and distribution of dynamic maps created using ArcGIS. ArcReader allows users to open the .pmf files, view and query a wide variety of spatial data in an interactive environment, print and copy maps. To download the stand-alone version of ArcReader on this disk, see the instructions below. For other instructions on using the software see the ArcReader Help menu, or visit the ArcReader section of the ESRI website at: http://www.esri.com/software/arcgis/arcreader/index.html.

Using ArcReader

Step 1 – System Requirements and Installation

The first step is to install the ArcReader software on your system. According to ESRI, ArcReader 8.3 will work on a PC-Intel system with Windows NT 4.0 service pack 6a, Windows 2000 or Windows XP operating systems. It will not work on Windows ME, 98 or earlier. Due to the relatively large amount of data used in the program, it is also required that the system have at least a 450 MHz processor and a minimum of 128 MB of RAM. The program will take up 200 MB of disk space on the system's hard drive.

To download the ArcReader software on this disk, you may either select "Click here to install the ArcReader software" from the startup Index.htm page, or navigate to the ArcReaderSoftware directory on the CD. From the 'ArcReaderSoftware' directory, double click on the ESRI.exe file and follow the program instructions.

NOTE: You will not be able to install this software on your system if it currently has ArcGIS software. If you attempt to add the software you will get an error indicating that existing ArcGIS software has been detected and the setup program will close out. In this situation it is mostly likely that ArcReader is already installed however, it should be noted that the .pmf file is viewable in any ArcGIS software package (i.e. ArcView).
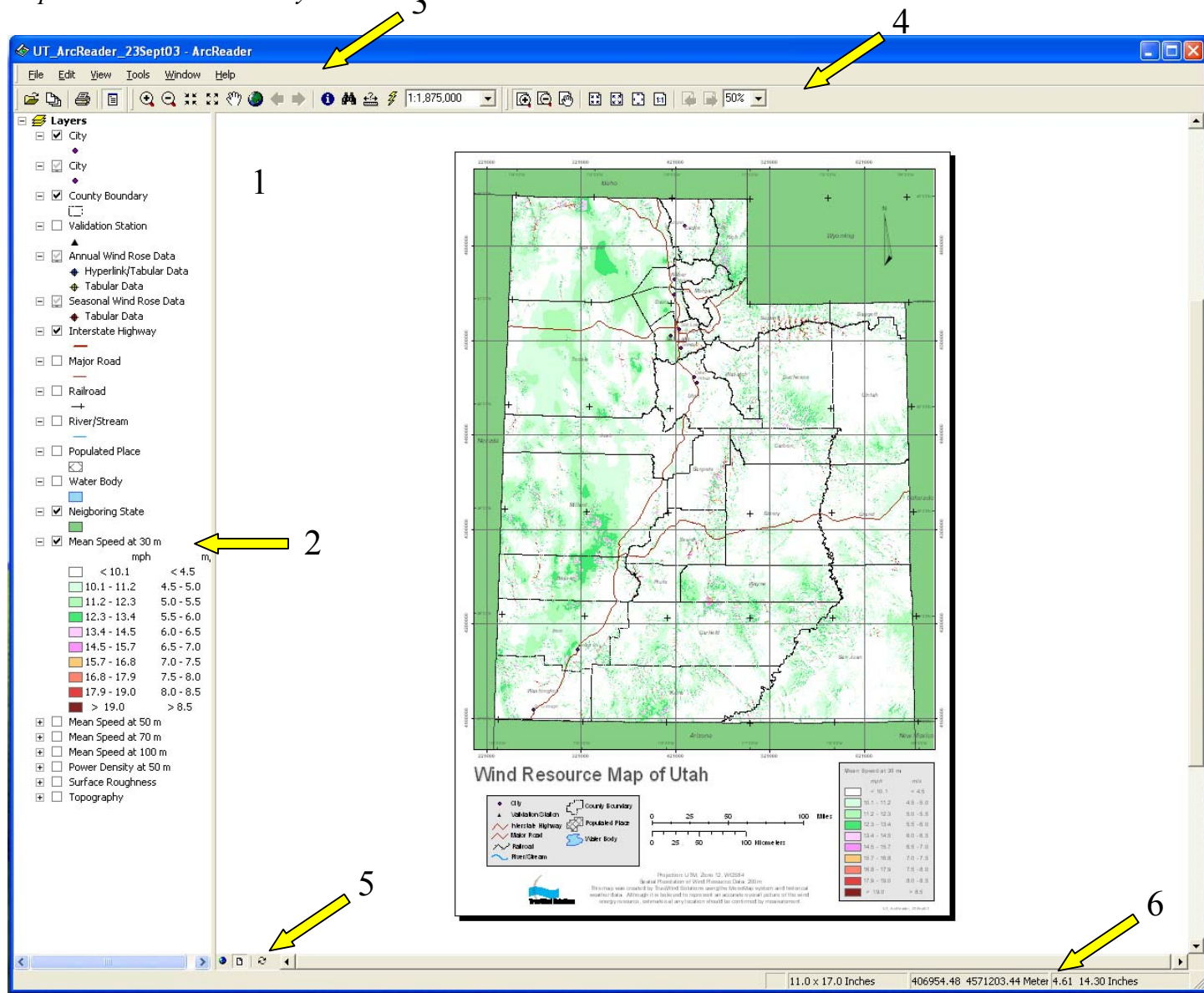
Step 2 – Opening the Project

The ArcReader project files have been formatted to a self-extracting zip file in order to maintain the data paths that are essential for the integrity of the WRE.

To download the data from the Index.htm startup page simply choose "Click here to extract the ArcReader project files" (please be patient, it may take several moments before the pop-up window will appear). From the pop-up window you may choose to either save the UT_ArcReaderDataFiles_02Dec03.exe file or open it directly.   Select the option to "Open" the file. Another pop-up window will appear that will prompt you to unzip the files to their proper location (again, this may take a few moments). NOTE: The default unzip location Utah ArcReader project from the Index.htm page, you must select the default location.

If you wish to download the data from the CD without going through the Index.htm page, navigate to your CD drive and double click on the UT_ArcReaderDataFiles_02Dec03.exe file. Click "Unzip" to download the files to the files to the default location (use the browse button to change the directory).

Step 3 – The ArcReader Layout

The ArcReader working environment contains a (1) Map Window, (2) Table of Contents (3) Menu, (4) Toolbar, (5) Refresh Button, Layout View/Data View Toggle, and (6) Coordinate Window. For more detailed information regarding the parts of ArcReader see the tutorial on the ArcReader installation disk.

Step 4 – Navigating ArcReader

The Map Window, Table of Contents and Toolbar will be the main components necessary for viewing and querying data in the WRDE.

Map Window

When the project is first loaded the map window will open with a printable map including a title, scale bars, north arrow, logos, and legend. This screen is considered the 'Layout View'. If you wish to modify, view, or print your map in absence of these features you can click on the 'Data View' button (globe) near the Refresh button as indicated by #5 in 'Step 3 - *The ArcReader Layout*'. The button in between the globe and refresh buttons will allow you to return back to the Layout View.

Table of Contents

The Table of Contents lists and displays the symbology for each map feature (layers). Directly to the left of the name for each layer is a small box that will either contain a checkmark, be blank, or grayed-out. The checkmark indicates the layer is turned on and is active in the map window; it will be visible unless covered by another layer (note that only one layer displaying wind resource an/or elevation data will be visible at a time). The layers without a checkmark are not active and thus not visible in the map window.

To adjust the appearance of the map, these layers can be turned on/off any time by a single click in the box. However, the grayed-out checkmark indicates layers with a predetermined visible scale range. These layers are not visible until they are at the appropriate scale for viewing, in which they can then be toggled on/off. To see the visible scale range for a layer right click on the layer name, click Properties and then click the General tab.

If you wish to show or hide the symbology for a specific layer, click in the box to the left of the active layers checkmark box. A plus sign indicates that the layer's symbology is hidden whereas a minus sign indicates that the symbology for the layer is visible.

Map Layers:
- City: There are two city layers. The first layer is visible until zoomed in at a scale of 1:1,000,000. The second layer is a more detailed city layer and becomes visible at a scale of 1:999,999.
- County Boundary
- Annual Wind Rose Hyperlink: This layer becomes visible at a scale of 1:350,000 and is represented by blue and yellow dots with a cross. All of the points have tabular data associated with them and can be viewed using the identify tool. Only the blue points have Wind Rose images available in JPEG format. The Wind Rose data includes the frequency, mean speed, and percent of total wind energy from each of 16 directions (starting due north clockwise). In order to view the related images for a given point, the Hyperlink tool must be used (see '*Main Toolbar Functions*' below).
- Seasonal Wind Rose: This layer becomes visible at a scale of 1:25,000
- Interstate Highway
- Major Road
- Railroad
- River/Stream
- Populated Place
- Water Body: The labels for this layer become visible at a scale of 1:450,000.
- Neighboring State
- These layers include a portion of the wind resource database, and display the mean wind speed and power density over the region in a grid (raster) format. Only one of these layers can be viewed at a time.
  - Annual Mean Wind Speed (30m, 50m, 70m, and 100m)
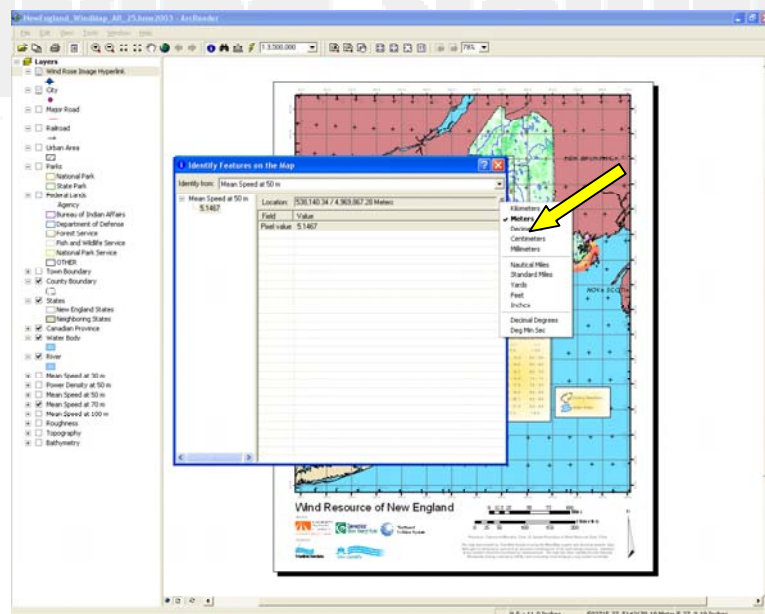 - Annual Wind Power Density (50m, and 100m)

- Surface Roughness: This layer is in grid format and cannot be displayed in conjunction with the wind maps.
- Topography: This layer is in grid format and cannot be displayed in conjunction with the wind maps.

At any point you may zoom to the extent of a given layer by right clicking on that layer and choosing 'Zoom to Layer Extent'. Using View >> Bookmarks in the main menu, you may zoom to the original "Full View" of the state.

Main Toolbar Functions:

- Zoom in by clicking a point or dragging a box around an area of interest
- Zoom out by clicking a point or dragging a box around an area of interest
- Zoom in on the center of the map by a factor of two with a single click
- Zoom out on the center of the map by a factor of two with a single click
- Pan (move) around the map by clicking on it and dragging in any direction
- Zoom to the full extent of all layers in the Table of Contents by a single click
- Zoom to the previous extent/Zoom to the next extent by a single click
- Identify related information about a feature by clicking on the tool and then clicking on that feature in the Map Window. When you first identify an object the program will automatically default to identifying information from the top most VISIBLE layer. If you wish to identify attributes from another layer you can then choose that layer under 'Identify from' in the information box.

  When using the identify tool the coordinates of the feature or feature part that is being queried are displayed in the identify box in a box titled 'Location'. The default coordinates are the units of the map projection, these units can be changed by clicking on the small box above the upper right corner of the 'Location' box as shown below.

- Measure distances between features on your map. Once you select the tool you can single click on the first feature then single click either at another point, or along a path you wish to measure. Double click to end you measurement. The distance will be displayed in the bottom left corner of the window. The unit measurement is in meters since the data projection is in UTM, meters coordinate system.
- Hyperlink from a Wind Rose point to the Wind Rose Image by clicking on the tool and clicking on one of the blue points in the map. This tool will automatically open the outside data for you to view. By simply holding the hyperlink button over the point, the program will display the file name of the Wind Rose image.

Layout View Toolbar:

Note that when you are in the Layout View, there are several tools available to the right of the scale text bar. Many of these buttons have similar symbols (magnifying glass, hand, etc) and are alike in function to the main tools mentioned above. However, the main tools will alter the appearance of the map in your layout whereas the layout tools will not. The layout tools will only allow you to move around the layout, they will not change the scale of the map.

Two additional layout tools are:
- Zoom to the full extent of the layout
- Zoom to the actual print size of you document

Step 5 – Copying and Printing Maps

Once you have selected an area of interest, you can copy the map to the Windows clipboard by selecting Copy Map from the Edit Menu. To print the image in your Map Window simply choose Print from the main menu, or click on the Print icon. Your Page Setup may also be adjusted under the main File menu.

For More Information

If you have any questions about the ArcReader program, please see the documentation under the Help menu, view the information on the ArcReader Installation disk, visit http://www.esri.com/software/arcgis/arcreader/index.html, or contact sclark@awsscientific.com.

For help with information about the database or any other aspects of the wind maps, contact mbrower@truewind.com.